

## CLAIMS:

Claim 1: What I claim as my invention is an internally resilient railroad tie, a tie containing two blocks placed in the tie case, independent of each other, one under each rail, further equipped as follows: Each block is placed in an elastomeric enclosure termed the boot. An elastomeric bottom pad is placed under each block inside each boot. The elastomeric bottom pad is supplied and applied in various values of stiffness to compensate for the lack or excess of the overall track stiffness at each tie location along the track. The mass of the block, the elastomeric bottom pad, and an elastomeric rail pad placed on the top of the block under the rail create a damper, a system consisting of a mass suspended between two elastic members. The properties of this damper system are adjustable by varying any or all of its components to compensate for variations of the overall dynamic response of the track.

Claim 2: The closure of Claim 1 wherein the block is made of concrete

Claim 3: The closure of Claim 1 wherein the block is made of steel

Claim 4: The closure of Claim 1 wherein the block is made of cast iron

Claim 5: The closure of Claim 1 wherein the block is made of a concrete/steel combination

Claim 6: The closure of Claim 1 wherein the block is made of plastic

Claim 7: The closure of Claim 1 wherein the block is made of wood

Claim 8: The closure of Claim 1 wherein the tie case is made of concrete

Claim 9: The closure of Claim 1 wherein the tie case is made of steel

Claim 10: The closure of Claim 1 wherein the tie case is made of cast iron

Claim 11: The closure of Claim 1 wherein the tie case is placed on ballast

Claim 12: The closure of Claim 1 wherein the tie case is placed on piles

Claim 13: The closure of Claim 1 wherein the tie case is placed on pile caps

Claim 14: The closure of Claim 1 wherein the tie case is placed on longitudinal beams

Claim 15: The closure of Claim 1 wherein the tie case is placed on a firm foundation such as rock, structural foundation created for this purpose, a tunnel invert or a bridge slab.

Claim 16: What I claim as my invention is the block of the internally resilient tie equipped with a block retainer, a device for retaining blocks in the tie when complete rail tie assemblies are lifted and moved by the rail during track installation and maintenance, and for releasing the blocks from the tie when the bottom elastomeric pad or the boot has to be replaced or removed.

Claim 17: The closure of Claim 16 wherein the block retainer and the block are not contiguous in service because the block retainer allows each block to follow the deflection of elastomers and the uplift wave of the rail within certain travel.

Claim 18: The closure of Claim 16 wherein the block retainer consists of cast iron insert equipped with a shank for anchorage in the concrete mass of the tie case, and with a curved slot at its top to receive spring leaves, held in the slot by their flexural pre-loads and secured by a vertical pin inserted into aligned holes in the leaves and in the shoulder as shown on the Drawing 3.

Claim 19: The closure of Claim 16 wherein the block retainer consists of cast iron insert equipped with a threaded extension for its attachment to the steel tie case, and with a curved slot at its top to receive spring leaves, held in the slot by their flexural pre-loads and secured by a pin inserted into aligned holes in the leaves and the shoulder as shown on the Drawing 4.

Claim 20: What I claim as my invention is the block of the internally resilient tie equipped with a device for rain water diversion and enhancement of electrical insulation properties of the block by the non-metallic collar attached to the block's perimeter and/or by the overhang-shaped elastomeric boot's edge to create dry areas under the collar, and/or under the lip of the boot in order to interrupt surface passage of electric currents, and to keep rainwater from entering the tie's interior along the vertical surfaces of the boot.